Claim Amendments

1. (currently amended) A method for determining a location of an object substantially touching a touch pad, the touch pad having a plurality of surrounding edges, said method comprising:

providing a light sheet comprising a plurality of light beams oriented to propagate in an air space over the touch pad such that the light sheet is partially blocked by the object when the object intrudes into the air space, wherein light intensity of the light sheet is spatially varying in such a manner that the light intensity of the partially blocked light sheet is dependent upon the location of the touching object, and wherein the light beams are provided by a first light providing structure disposed adjacent to a first surrounding edge and a second light providing structure disposed adjacent to a second surrounding edge opposite to the first surrounding edge, and wherein each of the first and second light providing structures has a longitudinal axis and further comprises a light source for providing a source beam along the longitudinal axis, and a plurality of partially reflecting surfaces distributed along the longitudinal axis to partially reflect the source beam for providing the light beams in the light sheet such that light intensity of the light beams varies along the longitudinal axis;

disposing a first light detecting structure adjacent to the second light providing structure, further from the first light providing structure, for measuring the light intensity of the light beams provided by the first light providing structure, wherein the measured light intensity is reduced when the light sheet is partially blocked by the object;

disposing a second light detecting structure adjacent to the first light providing structure, further from the second light providing structure, for further measuring the light intensity of the light beams provided by the second light providing structure, wherein the further measured light intensity is reduced when the light sheet is partially blocked by the object; and

calculating the location of the object based on the measured reduced intensity and the further measured reduced intensity.

2. (canceled)

3. (canceled)

4. (previously presented) The method of claim 1, wherein each of the first and second light providing structures comprises a plurality of substantially parallel plates having a plurality of interfaces between adjacent parallel plates to provide said partially reflecting surfaces.

5. (previously presented) The method of claim 1, wherein the light source comprises a laser.

6. (previously presented) The method of claim 1, wherein the light beam is a substantially collimated light beam.

7. (currently amended) The method of claim 1, wherein said surrounding edges further comprise a third surrounding edge and an opposing fourth surrounding edge, said method further comprising:

providing a third light providing structure adjacent to the third surrounding edge and a fourth light providing structure for providing a further light sheet in the air space over the touch pad such that the further light sheet is partially blocked by the object when the object intrudes into the air space, wherein light intensity of the further light sheet is spatially varying in such a manner that the light intensity of the partially blocked further light sheet is dependent upon the location of the object;

disposing a third light detecting structure adjacent to the fourth light providing structure, further from the third light providing structure, for measuring light intensity of part of the further light sheet provided by the third light providing structure;

disposing a fourth light detecting structure adjacent to the third light providing structure, further from the fourth light providing structure, for measuring the light intensity of part of the further light sheet provided by the fourth light providing structure, and

calculating the location of the touching object also based on the measured light intensity of the further light sheet provided by the third and fourth light providing structures.

8. (previously presented) A light detecting system for use in conjunction with a touch pad for determining a location of an object substantially touching the touch pad, the touch pad having a plurality of surrounding edges, said system comprising:

a light sheet comprising a plurality of light beams oriented to propagate in an air space over the touch pad such that the light sheet is partially blocked by the object when the object intrudes into the air space, wherein light intensity of the light sheet is spatially varying in such a manner that the blocked intensity is dependent upon the location of the object, and wherein the light beams are provided by a first light providing structure disposed adjacent to a first surrounding edge and a second light providing structure disposed adjacent to a second surrounding edge opposite to the first surrounding edge, and wherein each of the first and second light providing structures has a longitudinal axis and further comprises a light source for providing a source beam along the longitudinal axis, and a plurality of partially reflecting surfaces distributed along the longitudinal axis to partially reflect the source beam for providing the light beams in the light sheet such that light intensity of the light beams varies along the longitudinal axis;

a first light detecting structure disposed adjacent to the second light providing structure, further from the first light providing structure, for measuring the light intensity of the light beams provided by the first light providing structure through the second light providing structure for providing a signal indicative of a first measured light intensity, wherein the first measured light intensity is reduced when the light sheet is partially blocked by the object;

a second light detecting structure disposed adjacent to the first light providing structure, further from the second light providing structure, for measuring the light intensity of the light beams provided by the second light providing structure through the first light providing structure for providing a further signal indicative of a second measured light intensity, wherein the second measured light intensity is reduced when the light sheet is partially blocked by the object; and

a computation module, responsive to the signal and the further signal, for calculating the location of the object based on the first measured reduced intensity and the second measured reduced intensity.

9. (canceled)

10. (canceled)

11. (previously presented) The system of claim 8, wherein each of the first and second light providing structures comprises a plurality of substantially parallel plates having a plurality of interfaces between adjacent parallel plates to provide said partially reflecting surfaces.

12. (previously presented) The system of claim 8, wherein the light source comprises a laser.

13. (previously presented) The system of claim 8, wherein the light beam is substantially collimated.

14. (previously presented) The system of claim 8, wherein the light source emits light in the visible wavelength region.

15. (previously presented) The system of claim 8, wherein the light source emits light in the infrared wavelength region.

16. (previously presented) The system of claim 8, wherein said surrounding edges further comprise a third surrounding edge and an opposing fourth surrounding edge, said system further comprising:

a third light providing structure disposed adjacent to the third surrounding edge and a fourth light providing structure disposed adjacent to the fourth surrounding edge for providing a further light sheet in the air space over the touch pad such that the further light sheet is partially blocked by the object when the object intrudes into the air space, wherein ight intensity of the further light sheet is spatially varying in such a manner that the light intensity of the partially blocked further light sheet is dependent upon the location of the object;

a third light detecting structure disposed adjacent to the fourth light providing structure, further from the third light providing structure, for measuring light intensity of part of the further light sheet provided by the third light providing structure for providing to the computation module a third signal indicative of a third measured light intensity, wherein the third measured light intensity is reduced when the further light sheet is partially blocked the object; and

a fourth light detecting structure disposed adjacent to the third light providing structure, further from the fourth light providing structure, to measure the light intensity of further part of

the further light sheet provided by the fourth light providing structure for providing to the computation module a fourth signal indicative of a fourth measured light intensity of the further light sheet, wherein the fourth measured light intensity of the further light sheet is reduced when the light sheet is partially blocked by the touching object, so as to allow the computation module to calculate the location of the object also based on the third and fourth measured reduced light intensity of the further light.

17. (previously presented) The system of claim 8, wherein each of the first and second light detecting structures comprises:

a light detector for providing the signal; and

a light pipe for receiving at least a part of the light sheet and conveying at least a part of the received light to the light detector.

18. (previously presented) The system of claim 17, wherein the light pipe has a first end, an opposing second end, a longitudinal axis connecting the first end and the second end, and a pipe surface along the longitudinal axis, wherein the light detector is disposed at the first end, and wherein the pipe surface has diffractive or prismatic surfaces to convey said at least a part of the received light to the first end.

19. (previously presented) The system of claim 18, wherein each of the first and second light detecting structures further comprises:

a reflecting surface disposed at the second end of the light pipe for directing at least a further part of the received light toward the light detector.

20. (previously presented) The system of claim 19, wherein the reflecting surface is provided by a mirror disposed adjacent to the second end of the light pipe.

21. (previously presented) The system of claim 18, wherein each of the first and second light detecting structures comprises:

a further light detector disposed at the second end of the light pipe, wherein the diffractive or prismatic surfaces also convey a further part of the received light to the further

light detector for providing a further signal so as to allow the computation module to calculate the location of the touching object also based on the further signal.

22. (previously presented) The system of claim 11, wherein an air gap is provided between two adjacent parallel plates.

23. (previously presented) The system of claim 11, wherein a substantially transparent bonding material is provided between two adjacent parallel plates.

24. (previously presented) The system of claim 11, wherein the plurality of substantially parallel plates comprise plates made of materials of different refractive indices.

25. (previously presented) The system of claim 11, wherein at least a partial reflective coating is provided at each of the interfaces.